WHAT IS CLAIMED IS:

1. A hole-assisted single mode optical fiber comprising:

a first cladding region having a uniform refractive index;

a core region with a radius r1 having a refractive index higher than that of said first cladding region, and placed at a center of said first cladding region; and

a second cladding region including at least four air hole regions, each of which has a radius r2, is separated by a distance d from a center of said core region, and is placed in said first cladding region, wherein

the distance d is 2.0 to 4.5 times the radius r1 of said core region, and the radius r2 of said air hole regions is equal to or greater than 0.2 times the radius r1 of said core region.

2. The hole-assisted single mode optical fiber as claimed in claim 1, wherein the radius r1 of said core region is from 3.2 μm to 4.8 μm, and a relative index difference Δ of said core region from a refractive index of said first cladding region is in a range from 0.3% to 0.55%.

3. The hole-assisted single mode optical fiber as claimed in claim 2, wherein a mode field diameter (MFD) at a wavelength 1310 nm is from 7.9 μm to 10.2 μm.

4. The hole-assisted single mode optical fiber as claimed in claim 1, wherein a relative index difference Δ of said core region from a refractive index of said first cladding region is equal to or less than 0.12%, and an effective core radius A from the center of the core region to an extreme circumference of said air hole regions is in a range from 23 μm to 28 μm.